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The economic contributions of Tesla to the California economy, 2018–2021

Final report

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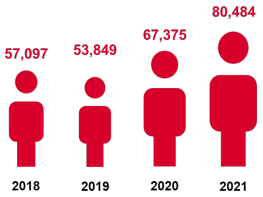
The contributions of Tesla to the California economy

$16.6 billion
in economic activity in 2021

Economic activity supported by Tesla in 2021 was 40% higher than the 2018-to-2020 average of $11.9 billion.



~80,500
Tesla-supported jobs

Tesla-supported jobs expanded over 40% from 57,097 in 2018 to 80,484 in 2021.

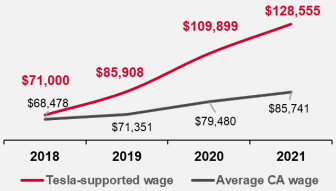
Over half of the jobs (42,037) during 2021 were in manufacturing, about 3.3% of the state's manufacturing employment.

$10.4 billion
of GSP in 2021

In 2021, Tesla helped deliver $10.4 billion ($28.5 million per day!) to California's gross state product, up from $7.9 billion in 2018.

$10.3 billion
in total wages

The total wages increased from $4.1 billion in 2018 to $10.3 billion in 2021.



+30%
higher average wage

From 2018 to 2021, the mean Tesla-supported wage was 30% higher than the average California wage.

~$1.0 billion
in taxes

Annual federal, state & local taxes averaged $930 million from 2018 to 2020, ramping up to $1.2 billion in 2021. Over 37% ($445M) went to state & local authorities in 2021.

Economic indicator	Average contributions 2018—2020			Contributions 2021		
	Direct (Tesla)	Indirect and induced[1]	**Total**	Direct (Tesla)	Indirect and induced	**Total**
Jobs	24,406	35,034	**59,440**	36,714	43,770	**80,484**
Economic activity	$4.6B	$7.3B	**$11.9B**	$7.4B	$9.2B	**$16.6B**
Gross state product	$3.4B	$3.8B	**$7.2B**	$5.4B	$4.9B	**$10.4B**
Wages	$2.8B	$2.6B	**$5.4B**	$7.0B	$3.3B	**$10.3B**

[1] Indirect and induced contributions are initiated from two streams of activity. The first from supply chain activity as Tesla engages its supplier and service networks. The second due to Tesla and supply chain workers spending large portions of their earnings in the California economy. These streams, in turn, stimulate additional rounds of indirect and induced economic activity, which are reflected in the reported results.

Source: The economic contributions of Tesla to the California economy, 2018–2021
IHS Markit, October 2022

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Executive Summary

Founded in 2003 with a vision to accelerate the world's transition to sustainable energy, Tesla, Inc. (Tesla) designs, manufactures and sells fully electric vehicles plus energy generation and storage systems. The company realized $53.8 billion in global revenue in 2021 and exited the year with a global workforce of more than 99,000 employees and a market capitalization exceeding $1 trillion. California accounted for $7.4 billion or 13.6% of sales and 36,700 Tesla employees, more than one-third of Tesla's workforce.

The contributions that accrue across California from Tesla's building, selling, leasing, and servicing vehicles in the state from 2018 through 2021 were assessed for five economic indicators: jobs; economic activity (e.g., sales); contribution to gross state product (GSP) or gross county product (GCP); wages; and taxes. The study did not assess additional contributions Tesla made through either its network of nearly 300 Supercharger locations or at the Megapack battery storage system locations such as at the Moss Landing electric sub-station.

Tesla's contributions to California go well beyond its direct sales and employment within the state. The company utilizes a network of California-based suppliers and service providers. Plus, Tesla employees and those of its suppliers stimulate additional consumer activity as they spend large portions of their wages with local businesses. The main takeaway from this study is Tesla stimulated significant contributions to the California economy during the study period of 2018 through 2021.

Tesla's contributions to the California economy, key findings:

- **Supported an average of 59,440 jobs from 2018 to 2020, rising to 80,484 jobs in 2021**
  - In 2021, this represented 0.5% of California employment or 1 out of every 208 jobs
  - For every 100 direct Tesla jobs, 50 more were supported in the supply chain and 68 by follow-on consumer activity
- **Stimulated economic activity (sales) of $16.6 billion in 2021 was 40% higher than the 2018 to 2020 average of $11.9 billion.**
  - This was equivalent to generating $44.4 million of economic activity every day in 2021
  - Tesla's direct sales rose from $5.7 billion in 2018 to $7.4 billion in 2021
  - Tesla directly spent over $1.6 billion with California suppliers in 2021, which triggered another $900 million in supply chain sales activity
- **Contributed $10.4 billion or 0.3% of California's gross state product (GSP) in 2021**
  - This was 42% higher than Tesla's 2018 to 2020 average GSP contribution of $7.2 billion.

  On average, $1.0 million of Tesla's revenue in California converts to $1.5 million in GSP
- **Stimulated an average annual wage of $128.6K in California during 2021**
  - This was 50% higher than the CA average annual wage of $85.7K
- **Approximately 30% of the economic contributions were stimulated by the local consumer spending of Tesla and its suppliers' employees**
- **Generated a total of $1.5 billion in California state & local taxes plus federal $2.5 billion in federal taxes from 2018 through 2021**

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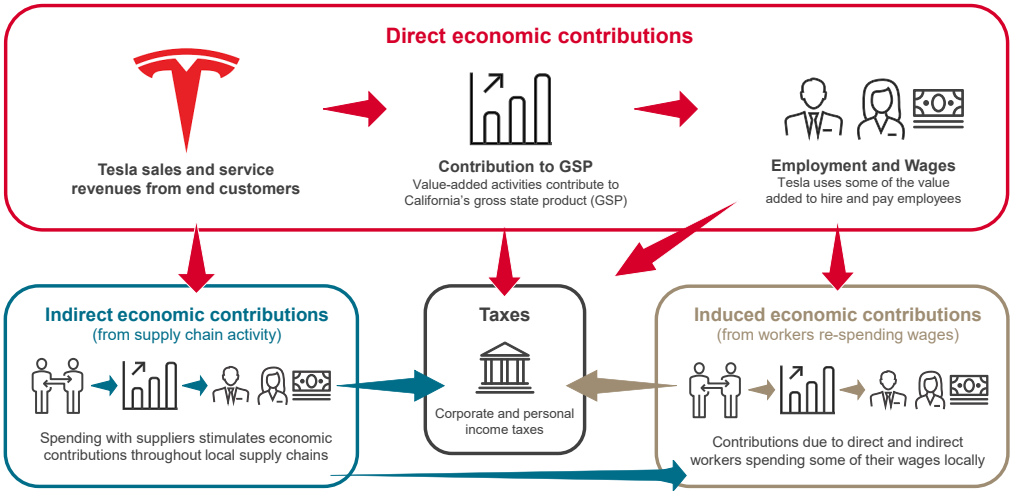
Introduction: How Tesla stimulates the California economy

There are three primary channels through which Tesla stimulates economic activity in California. Referring to the red box in the following graphic, end customers can buy vehicles directly from Tesla at 60 sales and service locations across the state. This allows Tesla to hire and pay employees, contribute to GSP, and pay taxes.



The second channel for economic contributions (the blue box in the lower left corner of the graphic) is initiated by Tesla sourcing from California suppliers and service providers. For example, Tesla directly spent almost $1.6 billion with California businesses in 2021, excluding contractors who worked as badged workers at Tesla facilities. These firms then engaged their local supplier and service provider networks, a process that iterated through all tiers of the extended supply chain. Finally, the third level, known as induced contributions, measures the follow-on contributions stemming from employees of Tesla and its suppliers spending significant portions of their salaries in the California economy. In 2021, Tesla employees took home over $7.0 billion while supply chain workers took home another $1.5 billion, much of which was spent locally.

The direct, indirect and induced economic contributions were assessed for the following indicators:

Economic activity (sales). In the context of an economic contribution, output represents the value of sales that occurred in California, at the state and county level, that are ultimately attributable to transactions initiated by or through Tesla.

Employment. To produce their goods and services, companies must hire and retain employees. This indicator measures the number of workers required to support a given level of sales activity within an economy.

Contribution to Gross State Product (value added). Gross state product (GSP) is the sum of value added across the California economy. GSP is generally considered the broadest measure of the health of a state's economy. The analogous concept at the national level is gross domestic product or GDP.

Labor Income. A subcomponent of value added, labor income captures the compensation paid to workers.

Government revenues. Companies and employees also pay taxes to federal and state and local authorities.

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Tesla's direct footprint in California

In 2021, Tesla directly employed over 36,700 workers[1] and realized $7.4 billion of revenue in California. The corresponding figures over the prior three-year period (2018 through 2020) averaged about 24,400 workers and $4.6 billion in revenues. Tesla's direct presence in California manifests in two ways. First, the company has manufacturing facilities, most notably the Fremont plant where Tesla vehicles are built and many of the components for those vehicles are made. In late 2021, the company broke ground on a Megafactory in Lathrop, where energy-storage products will be built. In 2021, the company employed more than 26,800 people in Fremont and almost 1,800 in Lathrop. Second, Tesla has 115 stores and service facilities across 24 counties where vehicles can be purchased and serviced. Following production challenges in 2019 and 2020, unit sales in California ramped up significantly in 2021.

Tesla's combined production, sales, and service activities are concentrated in seven counties. The following graphic shows how the employment and revenues were distributed across these counties and the remainder of California. Not surprisingly, the bulk of the direct Tesla jobs were in:

- Alameda County, where the Fremont plant is located
- San Joaquin County, where the Megafactory is located, and
- Santa Clara County, where the Tesla headquarters were located until December 2021.

Over 60% of Tesla's sales in California occurred in Alameda County, Los Angeles County, and Orange County.

Because the Fremont facility produces vehicles for markets beyond California, it is useful to consider the monetary flows back to California in a global context. During 2021, Tesla took in $7.4 billion of revenue in California, representing 14% of the company's global revenues of $53.8 billion. On the other side of the ledger, the company: (1) spent $1.6 billion with local suppliers; (2) spent another $1.0 billion with consultants that work at Tesla facilities; (3) paid its employees $7.0 billion in wages; (4) paid $0.4 billion in state & local taxes. The follow-on effects are discussed in the following section.

Tesla's average direct employment and revenues in California, 2018—2021

Alameda County

Metric	2018-2020 avg	2021
Tesla sales	$1,459M	$1,305M
Tesla Employment	17,577	26,831
Fremont	17,237	26,423

San Mateo

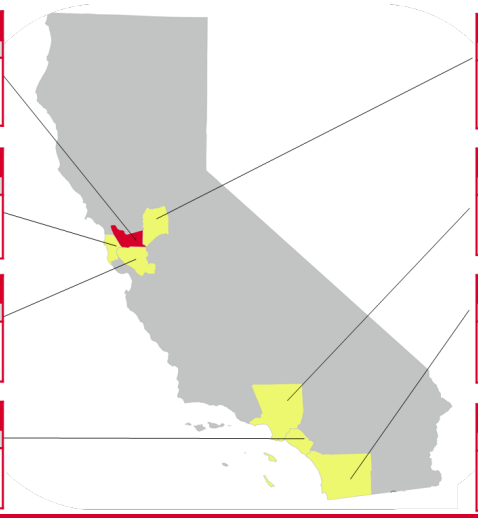
Metric	2018-2020 avg	2021
Tesla sales	$116M	$523M
Tesla Employment	458	768

Santa Clara County

Metric	2018-2020 avg	2021
Tesla sales	$1M	$32M
Tesla Employment	2,269	3,146

Orange County

Metric	2018-2020 avg	2021
Tesla sales	$942M	$1,599M
Tesla Employment	545	590



San Joaquin County

Metric	2018-2020 avg	2021
Tesla sales	$27M	$103M
Tesla Employment	956	1,896
Lathrop	886	1,791

Los Angeles

Metric	2018-2020 avg	2021
Tesla sales	$1,056M	$1,729M
Tesla Employment	1,120	1,343

San Diego County

Metric	2018-2020 avg	2021
Tesla sales	$405M	$623M
Tesla Employment	458	590

Rest of California

Metric	2018-2020 avg	2021
Tesla sales	$601M	$1,449M
Tesla Employment	1,025	1,550

Source: IHS Markit ©2022 IHS Markit

[1] Tesla also had 7,320 consultants working at its facilities in 2021. While consultant headcount is broken out in some tables in this report, spending on consultants was treated as an operating expense captured under supply chain spending.

Assessing Tesla's follow-on contributions to the California economy

The individual state and county economic models developed for this analysis, which are further explained in Appendix B, contain comprehensive information on the transactional linkages, employment requirements, value added (GSP/GCP contribution) and wage rates within and across more than 500 industries. This means the models can trace the economic contributions that accrue as money flows from an initial transaction (such as Tesla selling an electric vehicle to an end customer) through all supply chain tiers. In addition, the models can assess the contributions that accrue as employees spend large portions of their wages in their local economies on household purchases.

The core inputs for the models were developed by classifying Tesla revenues, operating expenses and capital expenditures by industry and county. These inputs were then used to quantify the direct, supply chain (indirect) and induced contributions to the key economic metrics. The average contributions to the state of California from 2018 to 2020 and for the year 2021 are summarized in the graphic below. For any of the metrics shown, examining the percent change between the 2018-2020 period and 2021 reveals that Tesla's ramp-up of production during 2021 was the primary source of enhanced economic contributions. Tesla's direct contributions grew in excess of 50%. This in turn, elevated the supply chain and induced contributions, which grew at slower (though still impressive) rates.

Tesla's 2021 production ramp-up is the primary source of enhanced economic contributions

Sales activity

Source	2018—20 (avg)	2021	Change
Tesla	$4.6B	$7.4B	59.9%
SC + Induced	$7.3B	$9.2B	26.7%
Total	$11.9B	$16.6B	39.6%

Jobs

Source	2018—20 (avg)	2021	Change
Tesla	24,406	36,714	50.4%
SC + Induced	35,034	43,770	24.9%
Total	59,440	80,484	35.4%

Gross State Product

Source	2018—20 (avg)	2021	Change
Tesla	$3.4B	$5.4B	59.7%
SC + Induced	$3.8B	$4.9B	29.1%
Total	$7.2B	$10.4B	43.5%

Wages

Source	2018—20 (avg)	2021	Change
Tesla	$2.8B	$7.0B	152.4%
SC + Induced	$2.6B	$3.3B	28.4%
Total	$5.4B	$10.3B	93.0%

Source: IHS Markit

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The table on the following page presents annual economic contributions Tesla stimulates in the state of California[2]. On average, Tesla realized $4.6 billion in sales in California between 2018 and 2020. The combined supply chain and induced economic activity (sales) averaged over $7.3 billion. This means every dollar of Tesla sales in California was matched by $1.57 of supply chain or induced sales (i.e., a multiplier of 1.57). In 2021, Tesla realized $7.3 billion of sales in California while the supply chain and induced sales came in at $9.2 billion, a multiplier of 1.25. The lower multiplier is consistent with Tesla's production ramp up as it is indicative of the effects of increased sales volumes of Tesla vehicles. While the sale of each Tesla vehicle would trigger a corresponding increase in spending on vehicle components, the general operating expenses (opex) required to run the plant would be spread over more vehicles. This means vehicle revenues would grow at a faster pace than the combined component and opex spending, leading to a lower sales multiplier.

[2] These results are broken out by the seven counties where Tesla makes 95% of its contributions in Appendix A.

It is also instructive to compare the additional jobs supported by direct Tesla jobs, known as a jobs multiplier. Referring to the following table, in 2021 for every 100 Tesla job in California, another 118 jobs were supported across the state (a jobs multiplier of 1.18). This underscores the fact that many more jobs are supported above and beyond the direct Tesla workforce.

Tesla's economic contributions to the State of California

Economic indicator	2018	2019	2020	Avg 2018-20	2021
Economic activity (sales in millions of USD)	**$12,465**	**$11,139**	**$11,999**	**$11,868**	**$16,567**
Tesla	$5,701	$4,010	$4,107	$4,606	$7,364
Supply Chain	$3,523	$4,046	$3,968	$3,846	$4,404
Induced	$3,241	$3,082	$3,924	$3,416	$4,800
Gross state product (GSP, millions of USD)	**$7,854**	**$6,643**	**$7,219**	**$7,239**	**$10,389**
Tesla	$4,226	$2,971	$3,036	$3,411	$5,449
Supply Chain	$1,711	$1,836	$1,856	$1,801	$2,086
Induced	$1,917	$1,836	$2,327	$2,026	$2,855
Wages (millions of USD)	**$4,054**	**$4,626**	**$7,404**	**$5,361**	**$10,347**
Tesla	$1,607	$2,164	$4,604	$2,792	$7,047
Supply Chain	$1,274	$1,347	$1,366	$1,329	$1,530
Induced	$1,172	$1,115	$1,435	$1,241	$1,770
Employment	**57,097**	**53,849**	**67,375**	**59,440**	**80,484**
Tesla employees	23,341	20,256	29,621	24,406	36,714
Consultants working for Tesla	7,093	6,348	6,615	6,685	7,320
Supply Chain: products and services	8,828	10,496	10,175	9,833	11,196
Induced	17,834	16,749	20,964	18,516	25,254
Taxes (corporate and personal)	**$903**	**$873**	**$1,014**	**$930**	**$1,174**
California - state & local	$333	$322	$382	$346	$445
Federal	$570	$551	$632	$584	$729
GSP for every $ of Tesla sales	**$1.38**	**$1.66**	**$1.76**	**$1.57**	**$1.41**
Jobs/100 Tesla jobs	**144**	**165**	**126**	**145**	**118**
Supply Chain	68	83	56	69	50
Induced	76	82	70	76	68
Average Tesla-stimulated annual wage in California	**$71,000**	**$85,908**	**$109,899**	**$90,199**	**$128,555**
Tesla	$68,868	$106,815	$155,426	$110,370	$191,936
Supply Chain	$80,017	$79,982	$81,331	$80,443	$82,642
Induced	$65,742	$66,584	$68,452	$66,926	$70,076

Source: IHS Markit ©2022 IHS Markit

The wages received by Tesla employees and supply chain workers are the catalyst for stimulating induced contributions. In 2021, they received combined wages of $10.3 billion. The resultant induced economic activity totaled $4.8 billion, which supported 25,254 induced jobs. Overall, about 30% of the economic contributions stimulated by Tesla are induced contributions. This underscores the power of workers' spending in their local economy.

In summary, Tesla has been a source of significant contributions to the California. As production ramped up in 2021, the magnitude of those contributions also ramped up, increasing more than 40% over the 2018 through 2020 period average. The study also found that the consumer activity of Tesla and supply chain workers spending their wages in the California economy resulted in about 30% of the economic contributions.

Conclusion

By several measures, Tesla's impact on the California economy grew considerably from 2018 to 2021. Tesla's total contribution to Gross State Product grew from $7.9 billion in 2018 to $10.4 billion in 2021, an improvement of 32%. California jobs supported by Tesla grew by 41%, from 57,097 in 2018 to 80,484 in 2021. In the same period, California's Gross State Product grew by 16% and its employment fell by 2%. Tesla's stronger pace of growth shows its outsize impact on the state. Similar growth trajectories in total gross output, wages, and taxes supported by Tesla operations/activity reflect the positive impact Tesla had on California businesses and residents over this timeframe.

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Appendix A: Detailed Results

Tesla's economic contributions to the State of California

Economic indicator	2018	2019	2020	Avg 2018-2020	2021
Sales activity (millions of USD)	**$12,465**	**$11,139**	**$11,999**	**$11,868**	**$16,567**
Tesla	$5,701	$4,010	$4,107	$4,606	$7,364
Supply Chain	$3,523	$4,046	$3,968	$3,846	$4,404
Induced	$3,241	$3,082	$3,924	$3,416	$4,800
Gross state product (GSP, millions of USD)	**$7,854**	**$6,643**	**$7,219**	**$7,239**	**$10,389**
Tesla	$4,226	$2,971	$3,036	$3,411	$5,449
Supply Chain	$1,711	$1,836	$1,856	$1,801	$2,086
Induced	$1,917	$1,836	$2,327	$2,026	$2,855
Wages (millions of USD)	**$4,054**	**$4,626**	**$7,404**	**$5,361**	**$10,347**
Tesla	$1,607	$2,164	$4,604	$2,792	$7,047
Supply Chain	$1,274	$1,347	$1,366	$1,329	$1,530
Induced	$1,172	$1,115	$1,435	$1,241	$1,770
Employment	**57,097**	**53,849**	**67,375**	**59,440**	**80,484**
Tesla employees	23,341	20,256	29,621	24,406	36,714
Consultants working for Tesla	7,093	6,348	6,615	6,685	7,320
Supply Chain: products and services	8,828	10,496	10,175	9,833	11,196
Induced	17,834	16,749	20,964	18,516	25,254
GSP for every $ of Tesla sales	**$1.38**	**$1.66**	**$1.76**	**$1.57**	**$1.41**
Jobs/100 Tesla jobs	**144**	**165**	**126**	**115**	**118**
Supply Chain	68	83	56	40	50
Induced	76	82	70	75	68
Taxes (millions of USD)	**$903**	**$873**	**$1,014**	**$930**	**$1,174**
California - state & local	$333	$322	$382	$346	$445
Federal	$570	$551	$632	$584	$729

Source: IHS Markit

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Tesla's economic contributions to Alameda County, California

Economic indicator	2018	2019	2020	Avg 2018-2020	2021
Sales activity (millions of USD)	**$7,189**	**$6,359**	**$6,756**	**$6,768**	**$8,371**
Tesla	$2,218	$1,218	$941	$1,459	$1,305
Supply Chain	$2,670	$3,057	$3,097	$2,942	$3,633
Induced	$2,301	$2,084	$2,718	$2,368	$3,434
Gross state product (GSP, millions of USD)	**$4,314**	**$3,515**	**$3,753**	**$3,861**	**$4,733**
Tesla	$1,668	$916	$708	$1,097	$987
Supply Chain	$1,284	$1,356	$1,431	$1,357	$1,699
Induced	$1,362	$1,243	$1,615	$1,407	$2,046
Wages (millions of USD)	**$2,965**	**$3,315**	**$5,324**	**$3,868**	**$7,628**
Tesla	$1,177	$1,556	$3,274	$2,003	$5,150
Supply Chain	$962	$1,009	$1,064	$1,012	$1,224
Induced	$827	$750	$986	$854	$1,255
Employment	**42,056**	**38,744**	**48,889**	**43,230**	**60,479**
Tesla employees	17,094	14,571	21,066	17,577	26,831
Consultants working for Tesla	5,818	5,429	5,832	5,693	6,775
Supply Chain: products and services	6,403	7,381	7,383	7,056	8,686
Induced	12,741	11,363	14,609	12,904	18,187
Taxes (corporate and personal, millions of USD)	**$266**	**$226**	**$226**	**$239**	**$217**
California - state & local	$23	$21	$23	$22	$29
Federal	$243	$205	$203	$217	$188

Source: IHS Markit

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Tesla's economic contributions to Los Angeles County, California

Economic indicator	2018	2019	2020	Avg 2018-2020	2021
Sales activity (millions of USD)	**$1,559**	**$1,195**	**$1,262**	**$1,339**	**$1,948**
Tesla	$1,236	$919	$1,011	$1,056	$1,729
Supply Chain	$155	$127	$94	$125	$53
Induced	$168	$150	$156	$158	$166
Gross state product (GSP, millions of USD)	**$1,076**	**$820**	**$876**	**$924**	**$1,395**
Tesla	$898	$667	$735	$767	$1,263
Supply Chain	$73	$60	$43	$59	$26
Induced	$105	$93	$98	$99	$106
Wages (millions of USD)	**$198**	**$209**	**$279**	**$228**	**$352**
Tesla	$80	$108	$184	$124	$258
Supply Chain	$49	$39	$29	$39	$21
Induced	$69	$61	$65	$65	$73
Employment	**2,730**	**2,318**	**2,385**	**2,478**	**2,426**
Tesla employees	1,159	1,015	1,186	1,120	1,343
Consultants working for Tesla	175	108	74	119	26
Supply Chain: products and services	469	384	279	377	159
Induced	927	811	847	862	898
Taxes (corporate and personal, millions of USD)	**$135**	**$127**	**$153**	**$139**	**$183**
California - state & local	$20	$19	$22	$20	$29
Federal	$116	$108	$131	$118	$153

Source: IHS Markit

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Tesla's economic contributions to Orange County, California

Economic indicator	2018	2019	2020	Avg 2018-2020	2021
Sales activity (millions of USD)	**$1,104**	**$1,199**	**$1,261**	**$1,188**	**$1,975**
Tesla	$1,028	$870	$929	$942	$1,599
Supply Chain	$18	$190	$189	$132	$215
Induced	$57	$140	$144	$114	$161
Gross state product (GSP, millions of USD)	**$804**	**$837**	**$883**	**$841**	**$1,413**
Tesla	$762	$644	$689	$698	$1,192
Supply Chain	$10	$107	$106	$74	$122
Induced	$32	$86	$88	$69	$99
Wages (millions of USD)	**$71**	**$167**	**$203**	**$147**	**$269**
Tesla	$44	$49	$84	$59	$113
Supply Chain	$8	$69	$69	$48	$98
Induced	$20	$49	$51	$40	$57
Employment	**1,039**	**2,076**	**2,143**	**1,753**	**2,370**
Tesla employees	636	460	538	545	590
Consultants working for Tesla	51	42	26	40	3
Supply Chain: products and services	45	806	799	550	915
Induced	307	769	780	619	862
Taxes (corporate and personal, millions of USD)	**$114**	**$132**	**$156**	**$134**	**$184**
California - state & local	$19	$19	$22	$20	$29
Federal	$95	$113	$134	$114	$155

Source: IHS Markit

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Tesla's economic contributions to San Diego County, California

Economic indicator	2018	2019	2020	Avg 2018-2020	2021
Sales activity (millions of USD)	**$482**	**$440**	**$494**	**$472**	**$718**
Tesla	$438	$366	$410	$405	$623
Supply Chain	$9	$21	$19	$16	$20
Induced	$34	$54	$65	$51	$74
Gross state product (GSP, millions of USD)	**$340**	**$305**	**$342**	**$329**	**$504**
Tesla	$315	$263	$295	$291	$451
Supply Chain	$6	$12	$11	$10	$12
Induced	$19	$29	$36	$28	$41
Wages (millions of USD)	**$43**	**$73**	**$118**	**$78**	**$149**
Tesla	$28	$45	$86	$53	$113
Supply Chain	$4	$10	$9	$8	$10
Induced	$12	$18	$23	$17	$26
Employment	**660**	**866**	**1,065**	**864**	**1,147**
Tesla employees	402	418	553	458	590
Consultants working for Tesla	37	77	54	56	55
Supply Chain: products and services	19	57	79	52	81
Induced	202	314	378	298	421
Taxes (corporate and personal, millions of USD)	**$54**	**$55**	**$68**	**$59**	**$74**
California - state & local	$17	$17	$20	$18	$23
Federal	$37	$39	$49	$41	$51

Source: IHS Markit

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Tesla's economic contributions to Santa Clara County, California

Economic indicator	2018	2019	2020	Avg 2018-2020	2021
Sales activity (millions of USD)	**$651**	**$598**	**$655**	**$635**	**$788**
Tesla	$2	$0	$0	$1	$32
Supply Chain	$269	$247	$221	$246	$226
Induced	$379	$351	$434	$388	$530
Gross state product (GSP, millions of USD)	**$381**	**$318**	**$353**	**$351**	**$438**
Tesla	$2	$0	$0	$1	$24
Supply Chain	$147	$103	$91	$114	$90
Induced	$232	$215	$262	$236	$323
Wages (millions of USD)	**$405**	**$434**	**$651**	**$497**	**$882**
Tesla	$145	$218	$412	$259	$604
Supply Chain	$111	$78	$69	$86	$68
Induced	$148	$138	$170	$152	$210
Employment	**4,833**	**4,296**	**5,182**	**4,771**	**6,066**
Tesla employees	2,112	2,041	2,653	2,269	3,146
Consultants working for Tesla	507	350	317	391	319
Supply Chain: products and services	379	218	178	258	154
Induced	1,836	1,687	2,034	1,852	2,448
Taxes (corporate and personal, millions of USD)	**$20**	**$19**	**$23**	**$21**	**$26**
California - state & local	$16	$15	$18	$16	$20
Federal	$4	$4	$5	$5	$6

Source: IHS Markit

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Tesla's economic contributions to San Joaquin County, California

Economic indicator	2018	2019	2020	Avg 2018-2020	2021
Sales activity (millions of USD)	**$390**	**$295**	**$310**	**$331**	**$433**
Tesla	$81	$0	$1	$27	$103
Supply Chain	$178	$161	$146	$162	$126
Induced	$130	$134	$164	$142	$204
Gross state product (GSP, millions of USD)	**$223**	**$153**	**$161**	**$179**	**$241**
Tesla	$58	$0	$0	$19	$74
Supply Chain	$95	$82	$75	$84	$61
Induced	$70	$72	$85	$76	$106
Wages (millions of USD)	**$160**	**$192**	**$309**	**$220**	**$470**
Tesla	$48	$91	$204	$114	$364
Supply Chain	$72	$60	$55	$62	$42
Induced	$39	$41	$50	$43	$64
Employment	**2,571**	**2,516**	**3,073**	**2,720**	**3,680**
Tesla employees	704	850	1,313	956	1,896
Consultants working for Tesla	432	279	250	320	126
Supply Chain: products and services	644	591	564	599	502
Induced	791	797	946	845	1,156
Taxes (corporate and personal, millions of USD)	**$28**	**$22**	**$25**	**$25**	**$33**
California - state & local	$16	$15	$18	$16	$20
Federal	$12	$7	$8	$9	$13

Source: IHS Markit

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Tesla's economic contributions to San Mateo County, California

Economic indicator	2018	2019	2020	Avg 2018-2020	2021
Sales activity (millions of USD)	**$12**	**$84**	**$352**	**$150**	**$581**
Tesla	$2	$65	$281	$116	$523
Supply Chain	$1	$6	$8	$5	$7
Induced	$9	$14	$64	$29	$52
Gross state product (GSP, millions of USD)	**$8**	**$62**	**$260**	**$110**	**$435**
Tesla	$1	$49	$212	$87	$397
Supply Chain	$1	$4	$5	$3	$4
Induced	$6	$9	$42	$19	$35
Wages (millions of USD)	**$14**	**$30**	**$196**	**$80**	**$175**
Tesla	$9	$21	$163	$64	$147
Supply Chain	$1	$3	$4	$2	$4
Induced	$4	$6	$29	$13	$23
Employment	**183**	**289**	**1,395**	**623**	**1,038**
Tesla employees	131	192	1,050	458	768
Consultants working for Tesla	3	20	26	16	10
Supply Chain: products and services	4	10	12	9	17
Induced	45	67	307	140	242
Taxes (corporate and personal, millions of USD)	**$16**	**$22**	**$51**	**$30**	**$64**
California - state & local	$16	$15	$19	$17	$22
Federal	$0	$7	$32	$13	$42

Source: IHS Markit

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Tesla's economic contributions to the rest of California					
Economic indicator	**2018**	**2019**	**2020**	**Avg 2018-2020**	**2021**
Sales activity (millions of USD)	**$1,080**	**$967**	**$908**	**$985**	**$1,753**
Tesla	$696	$574	$534	$601	$1,449
Supply Chain	$221	$237	$195	$218	$125
Induced	$163	$156	$180	$166	$180
Gross state product (GSP, millions of USD)	**$708**	**$634**	**$590**	**$644**	**$1,231**
Tesla	$523	$433	$396	$451	$1,061
Supply Chain	$95	$113	$94	$100	$71
Induced	$91	$88	$100	$93	$99
Wages (millions of USD)	**$198**	**$207**	**$324**	**$243**	**$422**
Tesla	$76	$76	$196	$116	$298
Supply Chain	$68	$80	$67	$71	$62
Induced	$55	$51	$61	$56	$62
Employment	**3,023**	**2,743**	**3,243**	**3,003**	**3,278**
Tesla employees	1,103	709	1,262	1,025	1,550
Consultants working for Tesla	70	43	36	50	6
Supply Chain: products and services	865	1,050	882	932	682
Induced	985	942	1,063	997	1,040
Taxes (corporate and personal, millions of USD)	**$270**	**$269**	**$311**	**$283**	**$394**
California - state & local	$208	$202	$240	$217	$274
Federal	$62	$67	$71	$67	$120

Source: IHS Markit

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Tesla's economic contributions to the City of Fremont, California					
Economic indicator	**2018**	**2019**	**2020**	**Avg 2018-2020**	**2021**
Sales activity (millions of USD)	**$3,912**	**$2,683**	**$2,714**	**$3,103**	**$3,401**
Tesla	$2,214	$1,157	$721	$1,364	$933
Supply Chain	$715	$678	$774	$723	$895
Induced	$983	$848	$1,219	$1,017	$1,572
Gross state product (GSP, millions of USD)	**$2,764**	**$1,859**	**$1,798**	**$2,141**	**$2,211**
Tesla	$1,698	$887	$551	$1,045	$715
Supply Chain	$511	$491	$556	$519	$623
Induced	$556	$481	$691	$576	$874
Wages (millions of USD)	**$1,786**	**$2,111**	**$3,951**	**$2,616**	**$5,978**
Tesla	$1,152	$1,531	$3,209	$1,964	$5,072
Supply Chain	$315	$304	$344	$321	$387
Induced	$319	$276	$397	$331	$519
Employment	**25,992**	**22,693**	**31,134**	**26,606**	**38,955**
Tesla employees	16,734	14,330	20,648	17,237	26,423
Consultants working for Tesla	4,394	4,253	4,724	4,457	5,099
Supply Chain: products and services	338	254	313	302	467
Induced	4,526	3,856	5,449	4,610	6,966

Source: IHS Markit ©2022 IHS Markit

Tesla's economic contributions to the City of Lathrop, California					
Economic indicator	**2018**	**2019**	**2020**	**Avg 2018-2020**	**2021**
Sales activity (millions of USD)	**$190**	**$102**	**$125**	**$139**	**$135**
Tesla	$81	$0	$1	$27	$0
Supply Chain	$78	$65	$67	$70	$56
Induced	$31	$38	$57	$42	$80
Gross state product (GSP, millions of USD)	**$121**	**$54**	**$63**	**$80**	**$85**
Tesla	$59	$0	$0	$20	$0
Supply Chain	$47	$35	$35	$39	$26
Induced	$15	$18	$28	$20	$59
Wages (millions of USD)	**$84**	**$123**	**$239**	**$148**	**$393**
Tesla	$42	$85	$193	$107	$344
Supply Chain	$29	$23	$23	$25	$18
Induced	$12	$15	$22	$16	$31
Employment	**1,414**	**1,500**	**2,066**	**1,660**	**2,653**
Tesla employees	616	797	1,244	886	1,791
Consultants working for Tesla	432	270	247	316	124
Supply Chain: products and services	147	172	192	171	204
Induced	218	261	383	287	534

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Appendix B: Economic impact methodology

To quantify the economic impacts presented in this study, 61 customized models—the state of California, 58 counties, plus Fremont and Lathrop—were created. Key inputs for creating the models were sourced from IMPLAN, Inc., a nationally recognized provider of economic impact modeling data, supplemented by proprietary data from S&P Global's US Regional Economic Service, US Business Market Insights (BMI) Service and US Comparative Industry Service.

The models use an industry-standard input-output modelling structure that maps economic sales transactions (output) to the required non-labor inputs required to produce a product or service. In theory, this approach links industry sales activity (output) to the first tier of supply chain activity (inputs). The supply chain activity also represents sales activity (output) for the first-tier suppliers, which is then fed back into the model to capture the next tier of supply chain activity. This process repeats through all subsequent tiers of the supply chain.

In 1973, economist Wassily Leontief won the Nobel Prize in economics for his groundbreaking research on input-output analysis. Leontief realized the input-output activity within an economy could be represented by a series of matrices. Though a full exploration of input-output analysis is beyond the scope of this appendix, there are two matrices of note that are core to economic impact analysis. The first, known as an input-output table (IO table), captures the dual role of industries as both producers of goods/services and receivers of money within an economy. To capture the production aspect, each industry's sales and first tier supply chain activity is captured within a column in the matrix. In essence, each column captures how much a given industry has to spend with its supplier industries in order to fulfill a sales obligation. Each industry is also represented by a row in the matrix , the sum of which is the money (income) that industry receives.

Perhaps the most notable and enduring aspect of Leontief's research is a method to transform an input-output table to a matrix that links production activity to demand. The Leontief Inverse Matrix, as it is widely known, lies at the heart of input-output models, allowing for all iterations of supply chain activity that result from a given sales transaction to be captured. When used in conjunction with value added and employee compensation data contained in the I/O table, the contributions to GDP (value added) and labor income can be determined. When and input-output modeling framework is extended to include institutional and structural details, such as household spending patterns, it becomes a Social Accounting Matrix (SAM) model.

The 61 models used for this study were built using SAM techniques. Each model captures how economic activity flows through 546 industries at the state, county and city levels.

The total economic impacts were calculated as direct, indirect, and induced impacts. As the name implies, direct impacts capture the revenues, employment, contribution to gross state product, etc., that are directly tied to Tesla's operations. In support of this activity, Tesla must engage its network of suppliers and service providers to source production inputs. This initiates multiple cycles of indirect impact, which cascade throughout multiple extended supply chains tiers as Tesla's suppliers (Tier 1) reach out to their suppliers (Tier 2) and so on.

Tesla and the indirect companies pay wages to their employees. The employees, in turn, spend large portions of their incomes in their local economy on consumer purchases, housing, etc. This triggers the third economic impact cycle known as induced impacts. Total economic impacts are derived by summing the direct, indirect, and induced impacts. Along the way, the direct, indirect, and induced activity generates both corporate and personal taxes at the state, local and federal levels.

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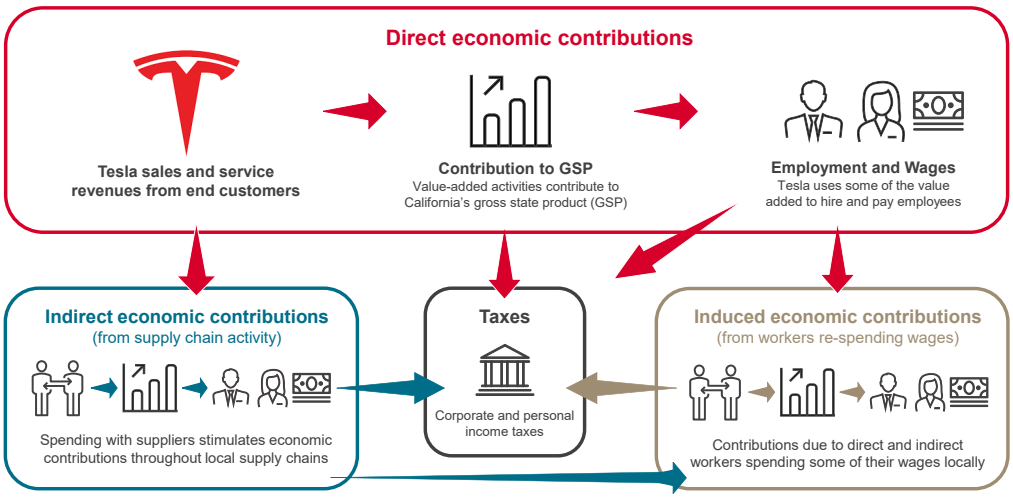

Source: IHS Markit 2022

Direct Effects

Direct effects are production changes associated with the immediate or final-demand changes. The notion of a multiplier rests upon the difference between the direct effect of a change in final demand and the total effects of that change. Two types of multipliers were used to compute the level of impacts:

Indirect Multipliers (Indirect effects / Direct effects)

Indirect effects are production changes in backward-linked industries caused by the changing input needs of directly affected industries (for example, additional purchases to produce additional output). A Type I multiplier, or indirect multiplier, is the direct effect produced by a change in final demand plus the indirect effect, divided by the direct effect. Increased demands are assumed to lead to increased employment and employee compensation. The Leontief Inverse Matrix (Type I multipliers matrix) is derived by inverting the direct coefficients matrix. The result is a matrix of total requirement coefficients, the amount each industry must produce for the purchasing industry to deliver one dollar's worth of output to final demand.

Induced Multipliers (Induced effects / Direct effects)

Induced effects are the changes in regional household spending patterns caused by changes in household income generated from the direct and indirect effects. Type SAM multipliers incorporate "induced" effects resulting from the household expenditures from new labor income. The default relationship is personal consumption expenditures and total household expenditure. Each dollar of workplace-based income is spent based on the SAM relationship generated by IMPLAN.

The core inputs for the models were developed by classifying Tesla revenues by county and its Tier 1 spending with suppliers by county and industry. The data was then aggregated by NAICS code and county to develop inputs that aligned with the industry structure of the economic impact models. The economic impact models then determined the direct, indirect, and induced contributions to employment, sales activity, GDP/GSP, taxes and wages by state. Finally, a proprietary methodology built on IHS Markit's proprietary Business Market Insights platform was used to distribute the state-level results to the congressional district level.

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Appendix C: Glossary of economic impact analysis terminology

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Capital expenditure (Capex)	This includes the investments made by establishments operating in a particular sector during a certain year, net of fixed assets sold.
Compound Annual Growth Rate (CAGR)	A measure of annual growth rate with the effect of compounding taken into account. The CAGR formula is equal to: [(ending value / beginning value) ^ (1/# of periods)] – 1
Corporate income tax	The tax levied on a corporation's income.
Direct impacts	The first-order responses throughout the economy due to direct sales transactions
Economic impact analysis	A study that examines the direct, indirect and induced impacts of the independent operators' production activities and supply chain spending.
Employment	This includes wages, salaries and self-employment jobs within the economy.
Extended supply chain	The network of suppliers who provide goods and services to the first tier of a supply chain. This is a subset of the indirect economic contributions.
Fiscal analysis	The estimation of the impacts of tax and non-tax contributions of an entity to the government in which it is currently operating.
Government revenues	The streams of revenues paid to a government agency.
Gross domestic product (GDP)	The sum of value added across all products and services produced within a national economy.
Gross state product (GSP)	The sum of value added across all products and services produced within a state economy.

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Indirect impacts	The follow-on supply chain or purchasing network activities that are initiated by direct spending.
Induced impacts	The response of the economy to marginal changes in consumer spending from employees of the direct and indirect businesses.
Input-output analysis	The analysis utilizes an input-output table that represents a particular economy and depicts the flows of related economic transactions that take place within the country. It also shows the economic interconnections that exist between different components of the economic system, i.e., production activities, the government and supplier enterprises.
Labor income	This captures all forms of employment income, including employee compensation (wages and benefits, employer-paid payroll taxes, unemployment taxes, etc.) and proprietor income (payments received by self-employed individuals and unincorporated businesses).
Operating expenditures (Opex)	This captures purchases of inputs and suppliers.
Output	The total value of all goods and services produced within an economy.
Personal income tax	The tax levied on an individual's income.
Supply chain	The combination of the direct and indirect suppliers.
Tier-1 suppliers	The suppliers with whom the independent operators directly spend their capital expenditure and operating expenditure funds.
Value added	The difference between the revenue received for a product or service and its non-labor input costs. It is also understood as the difference between the value of sale and the cost of its required non-labor inputs.

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